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The role of status quo bias in controversial transport policies: The counterfactual test

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Samenvatting

Steeds vaker wordt status quo bias in relatie gebracht met de acceptatie van transportbeleid. Deze rol is voornamelijk gesuggereerd als een mogelijke verklaring voor de verandering in acceptatie van transportbeleid na de implementatie, maar nog niet echt aangetoond. De counterfactual test is een potentiële techniek om bias ten aanzien van de status quo aan te tonen. Deze test richt zich op het omdraaien van beleidsopties. Als een beleidsalternatief de praktijk zou zijn, zouden mensen dan voorstander zijn van een verandering naar de huidige situatie? Of de wegenbelasting een gewenst alternatief is voor de kilometerheffing, als deze lang geleden zou zijn ingevoerd, zou een dergelijke test zijn. Door het vergelijken van het draagvlak van enerzijds een beleidsalternatief ten opzichte van de huidige situatie en anderzijds het draagvlak voor de huidige situatie als het beleidsalternatief de praktijk zou zijn, kunnen we meten of status quo bias inderdaad een rol speelt in de acceptatie van transportbeleid. In dit CVS-paper verkennen we deze rol van status quo bias in de acceptatie van transportbeleid door het stellen van de counterfactual test. Hiervoor zijn twee experimenten opgesteld waarin de acceptatie van enerzijds de belasting op de weg en anderzijds de snelheid op de weg getoetst wordt. De resultaten laten zien dat status quo bias inderdaad een rol speelt in de acceptatie van transportbeleid. Zo is het draagvlak voor beleid het hoogst wanneer dit beleid al geïmplementeerd is in de praktijk. Het draagvlak voor datzelfde beleid is juist een stuk lager wanneer deze optie een beleidsalternatief representeert. Hieruit volgt dat beleidsmakers moeten anticiperen op status quo bias gedurende de implementatie van controversieel transportbeleid.

1. Introduction

Controversial transport policies, that is '*policies on larger scale transport projects that have a relatively large impact on travel behaviour and that fuel much debate between proponents and opponents*' (Van Wee et al., 2023), are difficult to deal with. Public support for such controversial policies often changes over time. These policies commonly face strong initial opposition followed by growing support after introduction (Van Wee et al., 2023). With more and more large-scale interventions using transport policies, a thorough understanding of the mechanisms behind changing support for controversial transport policies is crucial.

Various mechanisms have been proposed which are able to explain why support increases after a policy has been implemented (Van Wee et al., 2023). For instance, the expected utility before introduction is not necessarily similar to the experienced utility after introduction (De Vos et al., 2016). In such a case, benefits turn out to be larger than expected (Börjesson et al., 2016). In line with this, disadvantages may be clearer than advantages before real-world implementation (Van Wee et al., 2023). For example, higher travel costs may have clearer implications for transport users than improved liveability. In addition, if people develop more positive or negative attitudes towards a policy it is likely that their support towards the policy will change too (Van Wee et al., 2023). Van Wee et al. (2019) explained how such attitudes may change over time. People may get to know things they did not know before, develop new experience, or are affected emotionally, which all lead to a change in attitudes and, in turn, change in support (Van Wee et al., 2019). Lastly, status quo bias has been suggested as a mechanism to explain changes in support (e.g. Eliasson, 2014; Börjesson et al., 2016). Individuals may prefer to stick with the status quo and resist change at all (Eliasson, 2014). Here, both loss aversion (any loss compared to the current situation is valued quite negatively) and cognitive dissonance (resistance lowers when introduction of the policy seems inescapable) explain how bias towards the status quo impacts support for policy (Börjesson et al., 2016).

Until now, a limited number of before-and-after studies on growing support for transport policies after implementation suggested status quo bias as a possible explanation, and all these studies focus on road pricing (Van Wee et al., 2023). For example, Eliasson (2014) interpreted increasing support for road pricing in Stockholm after its introduction as a form of status quo bias. In addition, Börjesson et al. (2016) concluded that status quo bias predominantly determines growing support for road pricing after implementation in Gothenburg since other mechanisms were not able to explain this growing support. Overall, little empirical evidence has been developed that indicates status quo bias indeed plays a role in changing support for controversial transport policies after its introduction.

The counterfactual test as proposed by Van Wee (2023) is a potential instrument to provide evidence of the role of status quo bias in controversial transport policies. This test asks people whether the counterfactual of a controversial policy would be a good idea (Van Wee, 2023). Suppose annual road taxes are the status quo and the government proposes to implement a per kilometre charge. Asking the counterfactual test might reveal whether the support for both policies is similar in a situation when a per kilometre charge is the status quo and the government proposes annual road taxes as new road pricing mechanism.

However, to the best of our knowledge, this test has not been the subject of empirical studies so far.

In this explorative study, we aim to empirically determine whether status quo bias indeed plays a role in shaping support for controversial transport policies using the counterfactual test. For this, the counterfactual test is conducted as part of two online questionnaires that also posed questions on sociodemographic characteristics. For this paper, we assessed both road pricing and speed limit policies. A total of 161 respondents completed the questionnaire on speed limit policies, whereas 305 respondents completed the survey on road pricing policies.

The remainder of this paper is structured as follows. Background information on status quo bias and the counterfactual test is provided in Section 2. The methods used to achieve this paper's aim are discussed in Section 3. Afterwards, Section 4 discusses the results of the analysis. Finally, Section 5 concludes the study.

2. Background

2.1 Status quo bias

Status quo bias is an individual's preference to disproportionally stick with the status quo (Samuelson and Zeckhauser, 1988). In other words, individuals prefer the current way of doing things, even if a change offers improvements (Lang et al., 2021). When one's current situation is non-optimal but improvements are neglected, status quo bias may hamper innovation (Godefroid et al., 2022).

Either loss aversion or cognitive dissonance may cause bias towards the status quo (Börjesson et al., 2016). For example, individuals may put more weight on losses than gains (Tversky and Kahneman, 1991). Since the costs of change carry more weight than potential benefits, these loss-averse individuals develop a biased preference towards the status quo (Eidelman et al., 2012). Besides loss aversion, cognitive dissonance may provide an explanation of status quo bias as well. According to the dissonance theory (Festinger, 1957), people seek consistency between cognitions and will reduce or eliminate any inconsistencies by changing one or both cognitions. The introduction of an alternative may evoke the feeling of cognitive dissonance (Schade and Baum, 2007). One way to reduce this dissonance is to generate a more positive attitude towards the alternative when the introduction seems inevitable (Börjesson et al., 2016). Another way, when the status quo seems to be maintained, is to exaggerate the advantages of the status quo and the disadvantages of an alternative (Jermias, 2001). Often, the biased preference to the status quo is alleviated when a policy intervention is inescapable (Börjesson et al., 2016). Overall, both loss aversion and cognitive dissonance explain situations in which change is avoided and decision-makers stick with the current status quo.

Status quo bias in decision-making has been studied regularly in the past. A key paper by Samuelson and Zeckhauser (1988) used a series of experiments to reveal that individuals indeed consistently show an irrational preference towards the status quo i.e. 'doing

nothing' or 'maintaining one's current or previous decision'. After this, status quo bias received growing interest in a variety of research contexts (Godefroid et al., 2022).

While a growing interest in status quo bias has been denoted in the past thirty years, the role of status quo bias in changing support for transport policies is not yet extensively addressed. Often, tailored approaches for specific research contexts are used to examine status quo bias (Godefroid et al., 2022). This also holds in the context of transport policy. For instance, Eliasson (2014) interpreted increased support for road pricing in Stockholm after its introduction as a form of status quo bias. In addition, Börjesson et al. (2016) concluded, contrary to other studies, that status quo bias predominantly determines growing support for road pricing after implementation, using a two-wave survey conducted before and after the introduction of road pricing in Gothenburg. Overall, these studies suggest that status quo bias impacts the support for road pricing in specific regions. Yet, little empirical evidence has been developed that indicates status quo bias indeed plays a role in shaping support for transport policies. To examine whether bias towards the status quo is consistently impacting support for such transport policies, we apply the counterfactual test, as discussed in the next section.

2.2 Counterfactual test

The counterfactual test has been proposed by Van Wee (2023) as an instrument to understand whether a controversial policy which received a lot of negative comments really is a bad idea. By discussing the counterfactual of a policy proposal with opponents, this test might indicate whether a policy is unfair or undesired. However, using various examples, Van Wee (2023) showed that by asking the counterfactual these unfair or undesired policies are often not so bad as initially thought.

The ongoing debate on converting annual road taxes per car to a per kilometre charge in the Netherlands is such an example. In the current situation, each car owner pays a fixed annual road tax. However, in an alternative situation, car owners pay a per kilometre charge. Those who drive more will pay more, whereas those who drive less will also pay less. While one could imagine that this new policy proposal will likely result in a fairer transport system, a lot of resistance has been expressed by citizens, journalists, politicians, and others. Often, examples of situations in which individuals are affected negatively are provided to illustrate why a per kilometre charge is a bad idea. Nonetheless, as stressed by Van Wee (2023), opponents might realise why the policy proposal is not so bad at all by discussing the counterfactual.

Suppose we have a road pricing mechanism in the form of a per kilometre charge; when the government suggests replacing this mechanism with an annual road tax per car, opponents are likely to emphasize that this new proposal is very unfair, because everybody would have to pay the same annual tax for a given car type, regardless of the actual use of that car. Discussing the counterfactual often illustrates that both proposals have winners as well as losers. Not accepting any loser will block almost any change. (Van Wee, 2023)

While the counterfactual test has been illustrated extensively in a qualitative manner by Van Wee (2023), to the best of our knowledge, this test has not been the subject of empirical studies so far. As of this, we explore the application of the counterfactual test by

examining the role of status quo bias in changing support for controversial transport policies after its introduction. Section 3 discussed the methodological approach used in this paper.

3. Methodology

To test whether bias towards the status quo indeed impacts the acceptance of transport policies, two experiments were designed. Whereas one experiment examined the acceptance of road pricing policies, another evaluated speed limit policies. These policies are chosen in light of the controversial transport policies suggested by Van Wee (2023). Both experiments were part of a survey that also posed questions on respondents their socio-demographic characteristics.

3.1 Socio-demographics and sample distributions

The first part of the survey was dedicated to the socio-demographic characteristics of respondents. Overlapping characteristics in both surveys are gender, age, level of education, and political affiliation. Other characteristics were tailored towards the transport policy assessed in the survey. For instance, the survey on road pricing posed questions on car ownership, driver's license, and travel distance by car. Contrary, the survey on speed limits only included questions regarding mode use. The respondents for this survey were recruited by Bachelor students of the TU Delft. These students set out the questionnaire among their social networks. A total of 161 respondents completed the questionnaire on speed limit policies, whereas 305 respondents completed the survey on road pricing policies.

Table 1 displays the sample distributions compared to the Dutch population distribution for overlapping socio-demographic characteristics. Comparing the sample with population distribution highlights that young persons and higher-educated individuals are overrepresented in both samples. Contrary, people older of age and lower-educated individuals are less represented. In addition, the distribution of political affiliation differs significantly across the two samples. Whereas the sample distribution for the survey on speed limit policies is similar to the population distribution, the sample distribution for the road pricing experiment shows that more left-wing voters are represented.

While both samples overrepresent certain groups, we believe that relevant insights can still be obtained from this convenience sample. Our aim is to explore if the counterfactual test works as suggested by Van Wee (2023), it is not to give representative insights into the precise magnitude of the status quo bias, plus the contribution of explanatory variables for this magnitude. To advance our knowledge on the role of status quo bias, we still recommend future studies to establish a thorough sample selection procedure (which might yield different results) when applying the counterfactual test.

Table 1. Sample and population distributions of socio-demographics.

Characteristic	Category	Sample for speed limit experiment (%)	Sample for road pricing experiment (%)	Dutch population[a] (%)
Gender	Male	51.6	44.9	49.7
	Female	46.6	52.1	50.3
	Other	1.9	1.0	-
Age (in years)	15 – 25	31.7	43.6	14.4
	25 – 45	21.7	13.4	30.1
	45 – 65	39.8	35.7	31.2
	65 +	6.2	3.6	24.3
Level of education	Below Bachelor	23.6	22.7	68.0
	HBO / WO	76.4	77.3	32.0
Political affiliation	Left	33.7	43.3	34.4
	Right	63.4	33.8	65.6
	Unknown	2.9	22.9	-

[a] Data retrieved from CBS Statistics Netherlands (https://opendata.cbs.nl/statline/#/CBS/en/) and PDC (https://www.parlement.com/id/vh8lnhrp8wsy/links_en_rechts)

3.2 Counterfactual test using a two-fold experiment

The second part of the survey was devoted to the counterfactual test. For this, we designed a two-fold experiment. Respondents were randomly allocated to one part of the experiment, in which they were asked to state their acceptance towards a reference and alternative policy. The two parts ensured that these reference and alternative policies were interchanged throughout the experiment. For the speed limit policies, we interchanged 30 km/h and 50 km/h as policy references and alternatives. For the road pricing policies, we varied between annual road taxes and a per kilometre charge. Figure 1 shows the survey flows used to conduct the counterfactual test for both speed limit and road pricing policies.

Speed limit experiment
For the speed limit experiment, the counterfactual test involved asking respondents to state their support towards a reference and alternative policy. Figure 2 shows an example of the first question, measuring respondents' acceptance towards the reference policy which was either 30 km/h or 50 km/h. Afterwards, the acceptance of the policy alternative representing 50 km/h (if 30 km/h was the reference) or 30 km/h (if 50 km/h was the reference) was asked too. This is shown in Figure 3.
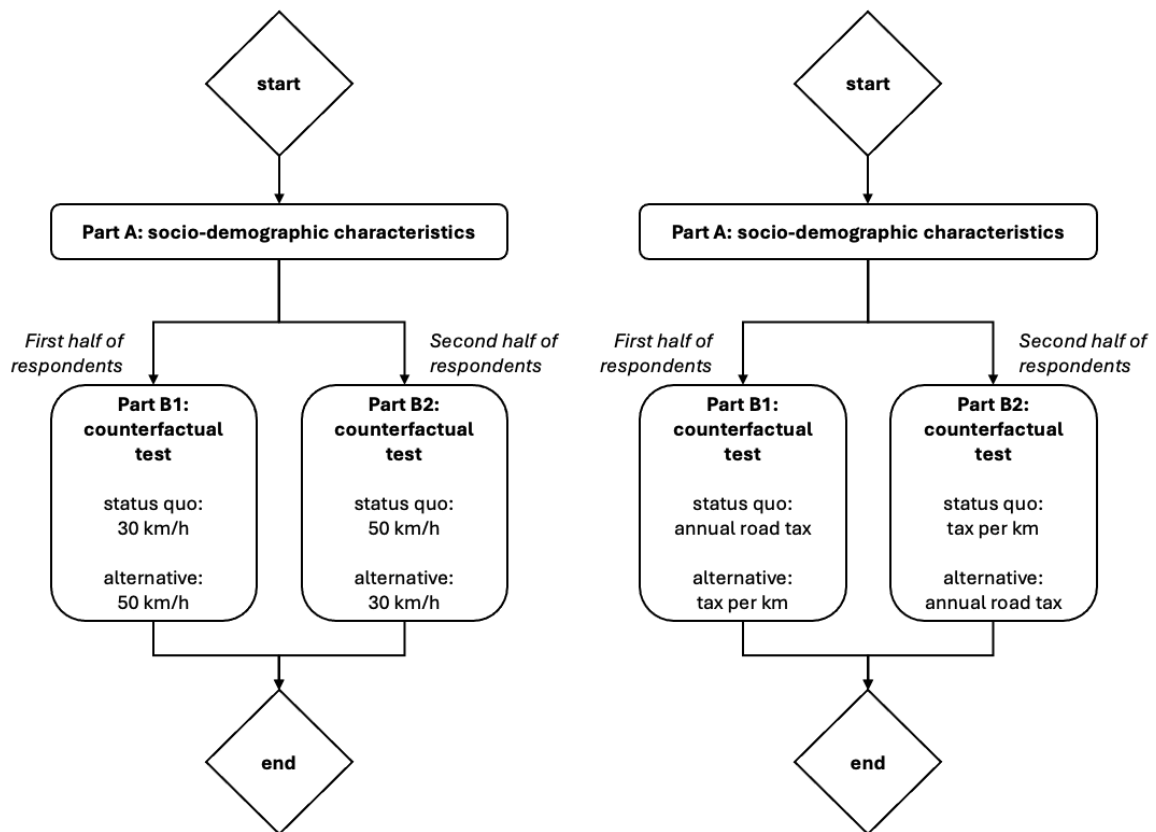
Figure 1. Survey flow to conduct the counterfactual test on speed limit policies (1a) and road pricing policies (1b).

Figure 2. An example of the first question of the speed limit experiment.

When answering this question, imagine that you live on this street.

What do you think of the fact that this street has a speed limit of 50 km/h?

	Disagree strongly	Disagree moderately	Disagree slightly	Undecided	Agree slightly	Agree moderately	Agree strongly
50 km/h is an appropriate limit.	○	○	○	○	○	○	○

Figure 3. An example of the second question of the speed limit experiment.

Road pricing experiment

For the road pricing experiment, the counterfactual test involved asking respondents to state his/her support towards a reference and alternative policy as well. Figure 4 shows the first part of the test, measuring respondents' acceptance towards the reference policy which was either annual road taxes or a per kilometre charge. Afterwards, the acceptance of the policy alternative representing charges per kilometre or annual road taxes respectively was asked too. This is shown in Figure 5.

Imagine that there is a country where the following policy applies: If you own a car, you pay a fixed amount per month based on the weight of the car, the fuel and how environmentally polluting the car is. On average, people pay 47 euros per month as road tax. To what extent do you support this policy? I am...

Strongly opposed	Moderately opposed	Slightly opposed	Undecided	Slightly in favour of	Moderately in favour of	Strongly in favour of
○	○	○	○	○	○	○

Figure 4. An example of the first question of the road pricing experiment.

Figure 5. An example of the second question of the road pricing experiment.

3.3 Analysis

For the analysis, we use independent samples t-tests to test the significance of the change in average acceptance towards road pricing and speed limit policies. The results of these tests are discussed in section 4.

4. Results

4.1 Acceptance of speed limit policies

Table 2 describes the variation in respondents' acceptance of speed limit policies across parts and groups. These variations highlight that the acceptance of 30 km/h as the speed limit is higher than the acceptance of 50 km/h. Whereas the acceptance of 30 km/h is above the scale middle value (4), implying that respondents mainly agree with the statement that 30 km/h is the most accurate speed limit for that street, the acceptance of 50 km/h is below the scale middle value.

Table 2. Descriptive statistics for respondents' acceptance towards speed limit policies.

Part	Status quo	Acceptance of ...	N	Mean	SD
1	30 km/h	30 km/h	77	5.78	1.13
1	30 km/h	50 km/h	77	2.60	1.59
2	50 km/h	30 km/h	84	5.30	1.82
2	50 km/h	50 km/h	84	3.60	1.95

Independent samples t-tests are conducted to further examine the variations in respondents' acceptance towards the transport policies. Here, Table 3 shows these differences across the two reference policies. Table 5 shows that the acceptance of both 30 km/h and 50 km/h as speed limits varies across the two reference policies. These acceptance rates significantly differ across the two reference points. The support for 30 km/h as speed limit equals 5.78 when 30 km/h is the status quo, yet this support lowers to 5.30 when 50 km/h is the status quo. Contrary, the support for 50 km/h as speed limit is highest when 50 km/h is the status quo, namely 3.60. This support lowers to 2.60 if 30 km/h is the status quo. Both mean differences across the reference points are significantly different. Overall, these differences in acceptance of a speed limit across the two reference

points suggest that bias towards the status quo plays a role in the evaluation of transport policies. The acceptance of a certain speed limit is consistently higher when this speed limit is the status quo.

Table 3. Results of independent samples t-tests for speed limit policies.

	Status quo policy 1: 30 km/h	Status quo policy 2: 50 km/h	Mean difference	*t* statistic	*p* value one-sided
Acceptance of					
30 km/h	5.78	5.30	- 0.48	- 2.038	0.022
50 km/h	2.60	3.60	1.00	3.574	< 0.001

4.2 Acceptance of road pricing policies

In line with the speed limit experiment, the acceptance of both road pricing policies varies across the reference policies. Table 4 shows these variations. Contrary to the speed limit experiment, all road pricing policies are above the scale middle value (4). As of this, both annual road tax and charge per kilometre policies have public support, independent of which policy is the status quo.

Table 4. Descriptive statistics for respondents' acceptance towards road pricing policies.

Part	Status quo	Acceptance of ...	N	Mean	Std error
1	Annual road tax	Annual road tax	155	4.76	1.60
1	Annual road tax	Tax per kilometre	155	4.69	1.73
2	Tax per kilometre	Annual road tax	150	4.25	1.67
2	Tax per kilometre	Tax per kilometre	150	4.70	1.65

Table 5 shows the independent samples t-tests conducted to establish whether the differences in acceptance rates across the two reference points are statistically significant. The acceptance of annual road taxes decreases from 4.76 to 4.69 when the reference point changes from annual road taxes to charges per kilometre. Table 5 also highlights that the mean difference of 0.51 is significant (P < 0.025). In addition, the acceptance of charges per kilometre decreases from 4.70 to 4.69 when the status quo situation changes. This mean difference is not statistically significant. Nonetheless, the results of the independent samples t-tests suggest that status quo bias indeed plays a role in the acceptance towards road pricing policies, in line with the results provided by the speed limit experiment.

Table 5. Results of independent samples t-tests for road pricing policies.

	Status quo policy 1: Annual road tax	Status quo policy 2: Tax per kilometre	Mean difference	*t* statistic	*p* value one-sided
Acceptance of					
Annual road tax	4.76	4.69	0.51	2.745	0.003
Tax per kilometre	4.69	4.70	- 0.01	- 0.050	0.480

5. Conclusions

This paper assessed the role of status quo bias in the acceptance of controversial transport policies using the counterfactual test proposed by Van Wee (2023). To do so, we set up a two-fold experiment in which participants were asked to state their acceptance towards either road pricing or speed limit policies. By interchanging these policies as status quo and alternative policies in the experiment, the counterfactual test was used to assess whether bias towards the status quo played a role in support for controversial policies. Overall, the counterfactual test showed that status quo bias indeed plays a role in shaping the acceptance of controversial transport policies. Speed limit and road pricing policies consistently denoted higher rates of acceptance when these policies were the status quo. Contrary, these policies received a lower rate of acceptance when proposed as a policy alternative to the current situation.

In general, politicians and policymakers should anticipate status quo bias when proposing an alternative transport policy. Growing support for some controversial policies after real-world implementation can be expected since results showed that changes in support for and acceptance of road pricing and speed limit policies can be attributed to status quo bias. By anticipating status quo bias and growing support after introduction, politicians and policymakers may well introduce controversial transport policies with strong initial opposition.

While the counterfactual test highlighted the role of status quo bias in the acceptance of transport policies, this study can benefit from future research in two ways. First, the analysis used a convenience sample which included an overrepresentation of younger-aged and higher-educated individuals. As of this, the samples were not representative for the population. This study can benefit from a more thorough sample selection procedure, which might reveal other results with regard to status quo bias in transport policies' acceptance. Second, this study operationalised the counterfactual test in a specific manner. Yet, other operationalisations may suffice as well. Therefore, future studies aimed at applying the counterfactual test are recommended to discover these possible avenues and their impact on the results.

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